4. Alignment and Adjustments (Electrical)

4-1 Preadjustment

4-1-1 Factory Mode

1. Do not attempt these adjustments in the Video Mode.

2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.

3. Do not tamper with the "Adjustment" screen of the Factory Mode menu. This screen is intended only for factory use.

4-1-2 When EEPROM (IC902) Is Replaced

1. When IC902 is replaced all adjustment data revert to initial values. It is necessary to re-program this data.

2. After IC902 is replaced, warm up the TV for 10 seconds.

4-1-3 When CRT Is Replaced

Make the following adjustments after setting up purity and convergence:

White Balance
Sub-Brightness
Vertical Center
Vertical Size
Horizontal Size

4-2 Factory ("Service") Mode

4-2-1 Procedure for the "Adjustment" Mode

1. This mode uses the standard remote control. The Service Mode is activated by: (1) pressing the "FACTORY" service key on the local-keyboard, or (2) by entering the following remote-control sequence (within 2 seconds):

   STAND-BY →DISPLAY →MENU→ MUTE→ POWER ON

2. The "SERVICE (FACTORY)" message will be displayed. The Service Mode has three components: Adjustment, Option Bytes and Reset.

3. Access the Adjustment Mode by pressing the "SELECT" keys (◀ ▶). The adjustment parameters are listed in the accompanying table, and selected by pressing the "SELECT" keys (▲,▼).

4. Selection sequences for the PAL / SECAM B / G, L systems:

   down or up key:
   TXP>SBT>SCT>SCR>STT>BCR>BLG>RG>
   GG>BG>PWL>SC>SL>VA>PUS>PHS>GRE>
   PEW1>CDL>BKS>PEW>PEP>PEUC>PELC>
   PDL>VSC>HP>HB>TC>WS

5. The "SELECT" keys (▲,▼) increase or decrease the adjustment values, (stored in the non-volatile memory) when Adjustment Mode is cancelled.

4-2-2 Adjust

OSD	Initial	Adjust	Range	Function	OSD	Initial	Adjust	Range	Function
TXP	4	Fix	0-7	Osd Position	PHS	38		0-63	Pal Horizon Shift
SBT	6		0-23	Sub Brigh	GRE	1	Fix	0-1	Greenish level
SCT	10		0-23	Sub Contrast	PEW1	37	Fix	0-1	EW (PANORAMA)
SCR	6	Fix	0-13	Sub Color	CDL	11	Fix	0-15	Cathode Drive Level
STT	9	Fix	0-13	Sub Tint	BKS	0	Fix	0-1	Black Stretcher
BLR	8		0-15	Low Light R	PEW	17		0-15	EW
BLG	8		0-15	Low Light G	PEP	20		0-15	EW Parabola
RG	32		0-63	High Light R	PEUC	23		0-63	Under Corner
GG	32	Fix	0-63	High Light G	PELC	32		0-63	Lower Corner
BG	32		0-63	High Light B	PDL	7	Fix	0-15	
PWL	15	Fix	0-15	Peak white level	VSC	30	Fix	0-63	
SC	11	Fix	0-63	S-Correction	HP	32	Fix	0-63	H-Paralleogram
SL	26	Fix	0-63	Vertical Slope	HB	32	Fix	0-63	Horizontal Bow
VA	40		0-63	Vertical Amplitu	TC	26		0-63	EW Trapezium
PVS	35		0-63	Pal vertical shift	WS	1	Fix	0-63	White Stretch

NOTE : PVS, VA, PHS, NVS, NHS parameters must be aligned using both the 50 Hz and 60 Hz vertical-field rates.

4-2-3 AGING Mode (Reference Only)

This pattern is used for pre-heating the CRT during manufacturing--it is accessed in the factory by twice pressing the "FACTORY" key .

Even if the TV power is cut off, the Aging Mode is not cancelled.
The "AGING" marking is displayed on the screen.
The AGING mode is cancelled by repressing the "FACTORY" key.

4-2-4 OPTION

NO	OSD	Adjust	Range		
1	HELP MSG	ON	ON/OFF		
2	LANGUAGE	EUROPE	EUROPE/RUSSIA/ARAB/E-EUROPE		
3	SYSTEM	CF	CF/CI/CW/CX/CB/CII		
4	ATS OPTION	ON	ON/OFF		
5	AUTO CLOCK	OFF(Fix)	ON/OFF		
6	S-Modulation	54%	54%/80%/100%		
7	TTX	ON	ON/OFF		
8	LNA	OFF	OFF/ON	RUSSIA ONLY	
9	WIDE OPTION	ON	OFF/ON	21”(OFF)	
10	COMBFICTER	OFF	OFF/ON	21” (OFF)	

4-2-5 RESET

The Reset Mode is used during factorying inspection

Function Reset : After Factorying Reset, the following items itens revert to their initial values.

1. Volume 11
2. Program Channel 1
3. P- STD MEMORY
4. Auto Power OFF
5. NR OFF
6. Skip(Store/Clear) ALL CLEAR

Cautim : When the EEPROM is replaced ; all items revert to their initial values.

4-3 Other Adjustments

4-3-1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. The picture should have good black and white details. There should be no objectionable color shading; if color shading is present, perform the purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent.

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

4-3-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 10 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

4-3-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to +130 volts (Full color bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.

2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).

3. The high voltage should not exceed 30KV.

4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 30KV under any conditions.

4-3-4 FOCUS Adjustment

1. Input a CROSS hatch signal.

2. Adjust the tuning (H-VR -> V-VR) for the clearest picture.

3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-3-5 Screen Adjustment

1. Turn to the White Signal.

2. Adjust the VR screen for a normal picture is (no blooming or flyback line).
   Input the Factory -> Mute key push(horizanal line) -> Screen VR tunning ->
   Power-LED Lamp flashing point Setting -> Mute key push

4-3-6 Purity Adjustment

1. Warm up the receiver for at least 20 minutes.

2. Plug in the CRT deflection yoke and tighten the clamp screw.

3. Plug the convergence yoke into the CRT and set in as shown in Fig. 5-1.

4. Input a black and white signal.

5. Fully demagnetize the receive by applying an external degaussing coil.

6. Turn the CONTRAST and BRIGHTNESS controls to maximum.

7. Loosen the clamp screw holding the yoke. Slide the yoke backward or forward to provide vertical green belt. (Fig. 5-2).

8. Tighten the convergence yoke.

9. Slowly move the deflection yoke forward, and adjust for the best overall green screen.

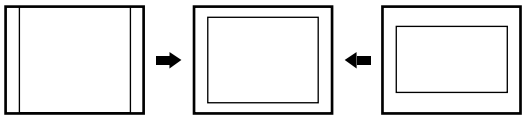
10. Temporarily tighten the deflection yoke.

11. Produce blue and red rasters by adjusting the low-light controls. Check for good purity in each field.

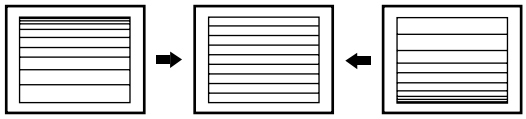
12. Tighten the deflection yoke.

4-3-7 I^{2}C BUS GEOMETRIC Adjust

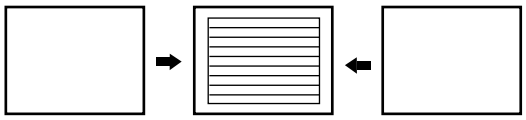
V SIZE(VA)



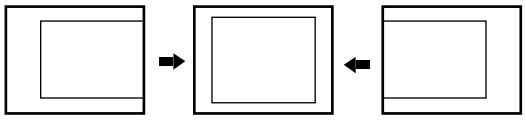
V LINEARITY (SL)



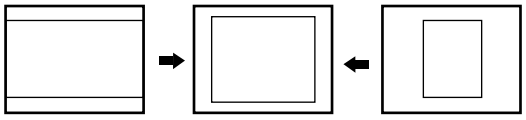
V S CORRECTION (SC)



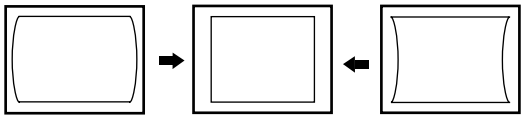
H POSITION (PHS)



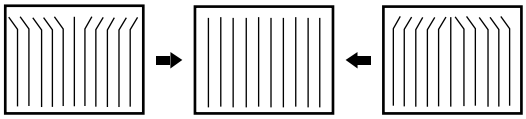
H SIZE



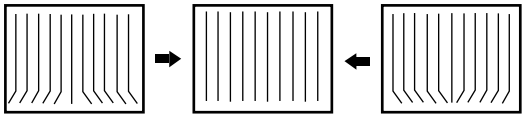
PIN COMP (PEP)



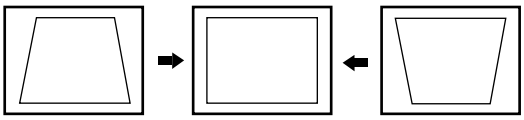
UP CPIN (PEUC)



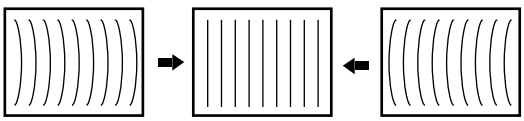
LO CPIN (PELC)



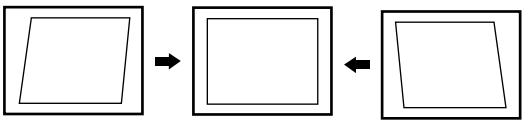
TILT (TC)



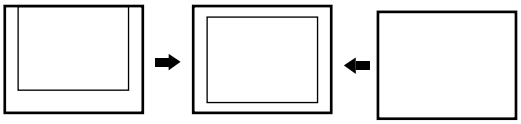
AFC BOW (HB)



AFC ANGLE (HP)



V POSITION (PVS)



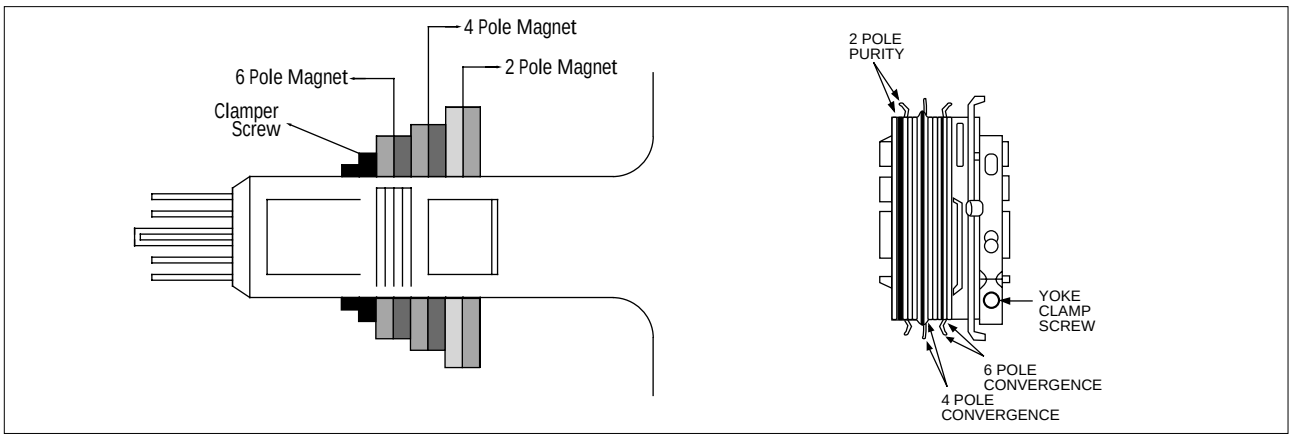


Fig. 5 -1 Convergence Magnet Assembly

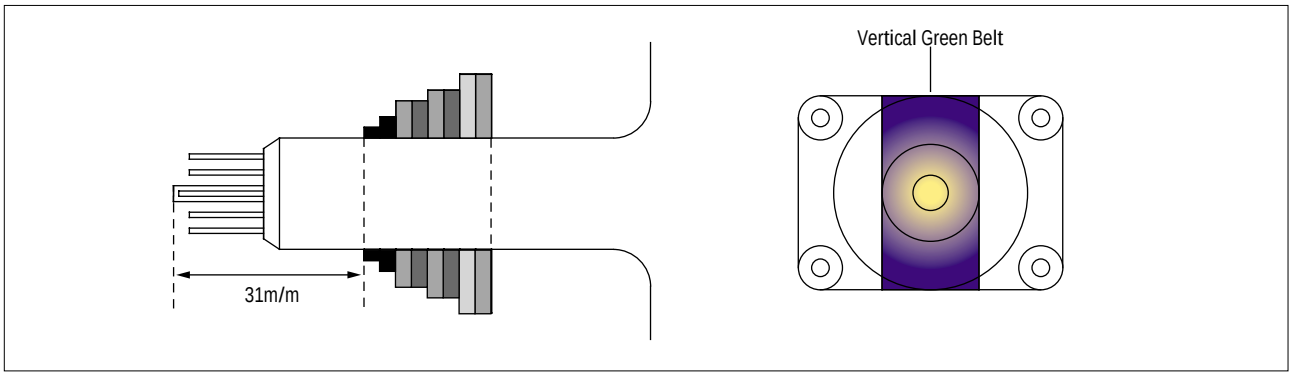


Fig. 5-2 Center Convergence Adjustment

4-3-8 White Balance Adjustment

4-4-7 (A) HIGH-LIGHT ADJUSTMENT

1. Input either a Lion Head or a “pure white” pattern.
2. Warm up the TV for 30 minutes.
3. Check the data in the Service Mode
4. Adjust RG, BG in the Factory Mode.

5-4-7 (B) LOW-LIGHT ADJUSTMENT

1. Automatically accomplished during the high-light adjustment.

4-3-8 Center Convergence Adjustment

1. Warm up the receiver for at least 20 minutes.

2. Adjust the two tabs of the 4 pole magnets to change the angle between them. Superimpose the red and blue vertical lines in the center area of the screen.

3. Adjust the Brightness and Contrast controls for a well defined picture.

4. Adjust the two-tab pairs of the 4 pole magnets, and change the angle between them. Superimpose the red and the blue vertical lines in the center area of the screen.

5. Turn the both tabs at the same time, keeping the angle constant, and superimpose the red and blue horizontal line in the center of the screen.

6. Adjust the two-tab pairs of the 6-pole magnets to superimpose the red and blue line onto the green. (Changing the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.)

7. Repeat adjustments 2~6, if necessary.

8. Since the 4-pole magnets and 6-pole magnets interact, the dot movement is complex (Fig. 5-3).

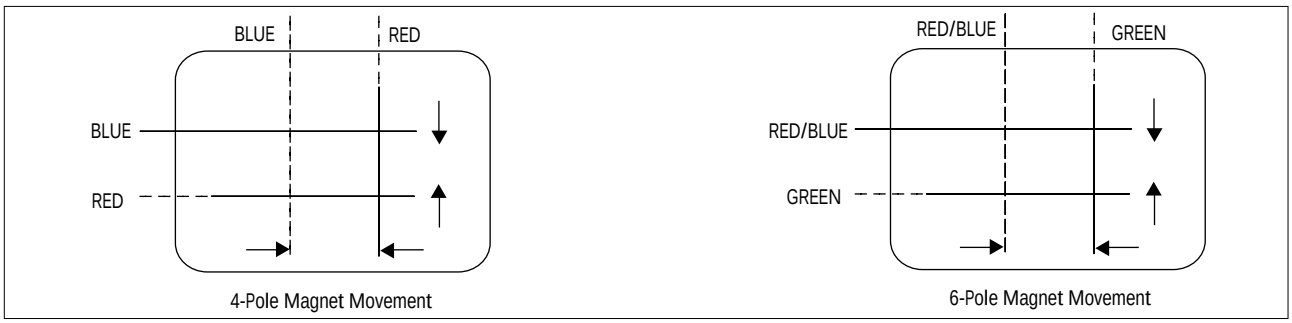


Fig 5-3 Center Convergence Adjustment